

**Claims.**

1. A timing belt autotensioner comprising first movable means contactable with a timing belt and in response to the direction of movement of the timing belt movable relative to a first location, second movable means supporting the first movable means and first location, said second movable means movable relative to a second location, and said second location spaced from the first location,

one-way engagement means adapted to remain disengaged in response to movement of the timing belt in a preferred direction and to engage in response to movement of the timing belt in the other direction, said one-way engagement causing engagement of the first movable means with the second movable means whereby the second movable means moves the first location and first movable means toward the timing belt, and

torque limiting means adapted to cause the one-way engagement means to at least momentarily release the one-way engagement means upon attainment of a predetermined torque during movement of the timing belt in the other direction.

2. A timing belt autotensioner comprising a pulley contactable with a timing belt, said pulley rotatable about a first axis at the pulley center, an eccentric arm structure supporting the pulley about the first axis and rotatable about a second axis, said second axis being spaced from the first axis,

one-way engagement means adapted to remain disengaged with rotation of the pulley in a preferred direction and to engage with rotation of the pulley in the other direction, said one-way engagement causing engagement of the pulley with the eccentric arm structure whereby the eccentric arm structure moves the first axis of rotation and pulley toward the timing belt, and

torque limiting means adapted to cause the one-way engagement means to at least momentarily release the one-way engagement means upon attainment of a predetermined torque during movement of the pulley in the other direction.

3. In a timing belt autotensioner comprising a pulley rotatable about a first axis and adapted to contact a timing belt, and an eccentric arm structure rotatable about a second axis spaced from the first axis, said eccentric arm structure supporting the pulley about the first axis and adapted to urge the first axis and pulley toward the timing belt during a preferred rotation of the pulley,

the improvement comprising a one-way clutch between the pulley and eccentric arm structure, said one-way clutch engageable in response to the other rotation of the pulley thereby rotating the eccentric arm structure to move the first axis and pulley toward the timing belt, and

torque limiting means adapted to cause the one-way clutch to at least momentarily release upon attainment of a predetermined torque during other rotation of the pulley.

4. The timing belt autotensioner of claim 3 wherein the one-way clutch  
5 is a ratchet comprising at least one pawl and a ratchet wheel.

5. The timing belt autotensioner of claim 3 wherein the one-way clutch is diametrically less than the diameter of the pulley.

6. In a timing belt autotensioner comprising a pulley rotatable about a first axis and adapted to contact a timing belt, and an eccentric arm structure rotatable  
10 about a second axis spaced from the first axis, said eccentric arm structure supporting the pulley about the first axis, and adapted to urge the first axis and pulley toward the timing belt during a preferred rotation of the pulley,

the improvement comprising a one-way clutch and gear train between the pulley and eccentric arm structure, said one-way clutch and gear train engageable  
15 in response to the other rotation of the pulley thereby causing the gear train to rotate the eccentric arm structure to move the first axis and pulley toward the timing belt, and

torque limiting means adapted to cause the one-way clutch to at least momentarily release upon attainment of a predetermined torque during other rotation  
20 of the pulley.

7. The timing belt autotensioner of claim 6 wherein the one-way clutch and gear train comprises at least one pawl and ratchet wheel, said ratchet wheel including a first gear,

a second gear meshed with the first gear and rotatable about a fixed  
25 third axis, and gear teeth on the eccentric arm structure, said gear teeth meshed with the second gear.

8. The timing belt autotensioner of claim 6 wherein the one-way clutch and gear train is diametrically less than the diameter of the pulley.

9. In a timing belt autotensioner comprising a pulley rotatable about a first axis and adapted to contact a timing belt, and an eccentric arm structure rotatable  
30 about a second axis spaced from the first axis, said eccentric arm structure supporting the pulley about the first axis, and hydraulic means adapted to urge the first axis and pulley toward the timing belt during a preferred rotation of the pulley,

the improvement comprising a one-way clutch between the pulley and  
35 eccentric arm structure, and said second axis being spaced beyond the periphery of the pulley, said one-way clutch engageable in response to the other rotation of the pulley thereby rotating the eccentric arm structure to move the first axis and pulley toward the timing belt and the eccentric arm structure away from the hydraulic means, and

torque limiting means adapted to cause the one-way clutch to at least momentarily release upon attainment of a predetermined torque during other rotation of the pulley.

5           10.     The timing belt autotensioner of claim 9 wherein the eccentric arm structure engages a hydraulic actuator.

          11.     The timing belt autotensioner of claim 10 wherein the one-way clutch is a ratchet comprising at least one pawl and a ratchet wheel.

          12.     The timing belt autotensioner of claim 9 wherein the one-way clutch is diametrically less than the diameter of the pulley.

10           13.     In a timing belt autotensioner comprising a pulley rotatable about a first axis and adapted to contact a timing belt, and an eccentric arm structure rotatable about a second axis spaced from the first axis, said eccentric arm structure supporting the pulley about the first axis and adapted to urge the first axis and pulley toward the timing belt during a preferred rotation of the pulley,

15                     the improvement comprising separate means adapted to contact the timing belt at a location spaced from the pulley contact with the timing belt, said separate means movable in response to the direction of movement of the timing belt, and in response to movement of the timing belt in a non-preferred direction, actuating movement of the eccentric arm structure to move the first axis and pulley toward the timing belt, and

                          torque limiting means adapted to cause the separate means to at least momentarily release upon attainment of a predetermined torque during movement of the timing belt in a non-preferred direction.

25           14.     The timing belt autotensioner of claim 13 wherein the separate means comprises a second pulley rotatably mounted on a second arm structure, said second arm structure engageable with the eccentric arm structure.

          15.     The timing belt autotensioner of claim 14 wherein said second pulley includes a second one-way clutch engageable in response to movement of the timing belt in the non-preferred direction.

30           16.     The timing belt autotensioner of claim 14 wherein gear teeth on the second arm structure and eccentric arm structure mesh to provide the engagement.

          17.     The timing belt autotensioner of claim 14 including a limit stop to prevent over centering of the second arm structure.